TG: @Chalnaayaaar

Exercise - I (Conceptual Questions) Build Up Your Understanding

1. Which one of the following is not true about antibiotics?
(1) First anitobiotic was discovered by Alexander Fleming
(2) The term 'antibiotic' was coined by S. Waksman in 1942.
(3) Some persons can be allergic to a particular antibiotic
(4) Each antibiotic is effective only against one particular kind of germ.

2. Which one of the microorganism is used for production of citric acid in industries ?
(1) *Lactobacillus bulgaricus*
(2) *Penicillium citrinum*
(3) *Aspergillus niger*
(4) *Rhizopus nigricans*

3. Formation of vinegar from alcohol is caused by :-
(1) *Bacillus subtilis* (2) *Clostridium*
(3) *Acetobacter aceti* (4) *Azotobacter*

4. Biogas consists of:-
(1) Carbon monooxide, methane and hydrogen
(2) Carbon dioxide, methane and hydrogen
(3) Carbon monooxide, ethane and hydrogen
(4) Carbon dioxide, ethane and hydrogen

5. Biogas is produced by anaerobic breakdown of biomass of agricultural waste by methanogenic bacteria. It is a:-
(1) One step process
(2) Two step process
(3) Three step process
(4) Multistep process

6. Beer is obtained from :-
(1) Molasses (2) Grapes
(3) Barley (4) Rye

7. Maximum percentage of alcohol present in the product of yeast fermentation :-
(1) Brandy (2) Gin
(3) Rum (4) Wine

8. Which of the following Microorganisms use for swisss cheese ?
(1) *Propionibacterium*
(2) *Geotrichum*
(3) *Penicillium*
(4) *Streptococcus*

9. Rate limiting material in biogas production is:
(1) Methane (2) Cellulose
(3) Starch (4) Acetic acid

10. Which group is not related with petroplantation
(1) Euphorbiaceae (2) Asclepiadiaceae
(3) Apocyanaceae (4) Leguminaceae

11. What are the advantage of gobar gas over convential utilization :-
(1) More efficient source of energy
(2) Used as good fertilizer
(3) Reduces the chances of spreading of pathogens
(4) All the above

12. Milk is changed into curd by :–
(1) *Bacillus Megatherium*
(2) *Acetobactor aceti*
(3) *Xanthomonas citri*
(4) *Lactobacillus acidophilus*

13. *Saccharomyces cerevissae* is used in the formation of :-
(1) Ethanol (2) Methanol
(3) Acetic acid (4) Antibiotics

14. Modern farmer's can increase the yield of Paddy upto 50% by the use of :-
(1) Cyanobacteria
(2) Rhizobium
(3) Mycorrhiza
(4) Farm yard manure

15. Which one produce gas by decomposing the gobar (Dung) in gobar gas:-
(1) Fungus
(2) Virus
(3) Methanogenic bacteria
(4) Algae

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16. Which of the following is used to manufacture ethanol from starch?
(1) Penicillin (2) Saccharomyces
(3) Azotobactor (4) Lactobacillus

17. Which of the following is the pair of biofertilizers?
(1) *Azolla* and BGA
(2) *Nostoc* and legume
(3) *Rhizobium* and grasses
(4) *Salmonella* & *E. coli*

18. Which bacteria is utilized in Gober gas plant?
(1) Methanogens
(2) Nitrifying bacteria
(3) Ammonifying bacteria
(4) Denitrifying bacteria

19. During the formation of bread it becomes porous due to release of CO_2 by the action of:-
(1) Yeast (2) Bacteria
(3) Virus (4) Protozoans

20. During anaerobic digestion of organic waste, such as in producing biogas, which one of the following is left undergraded?
(1) Lipids (2) Lignin
(3) Hemi-cellulose (4) Cellulose

21. The term "antibiotic" was coined by :-
(1) Edward Jenner (2) Louis Pasteur
(3) Selman waksman (4) Alexander Fleming

22. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is?
(1) *Anabaena* (2) *Tolypothrix*
(3) *Chlorella* (4) *Rhizobium*

23. The technology of biogas production was developed in India mainly due to the efforts of:
(1) IARI (2) KVIC
(3) both (1) and (2) (4) WHO

24. Biogas produced by anaerobic fermentation of waste biomass consists of :-
(1) methane
(2) traces of H_2, H_2S and N_2
(3) CO_2
(4) all of these

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25. Which one of the following is used in the making of bread ?
(1) *Rhizopus stolonifer*
(2) *Saccharomyces cerevisiae*
(3) *Zygasaccharomyces*
(4) *Saccharomyces ludwigi*

26. A common biocontrol agent for the control of plant diseases caused by fungi is :-
(1) *Agrobacterium*
(2) *Glomus*
(3) *Trichoderma*
(4) Baculovirus

27. Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition?
(1) *Glomus* (2) *Trichoderma*
(3) *Azotobacter* (4) *Aspergillus*

28. Lactic acid bacteria (LAB) grow in milk and convert it to curd and also improve its nutritional quality by increasing: -
(1) Vitamin A
(2) Vitamin B_{12}
(3) Vitamin B_6
(4) Vitamin C and A

29. The puffed-up appearance of dough is due to:–
(1) Growth of LAB
(2) Production of O_2 and ethanol
(3) Production of CO_2
(4) Growth of yeast *Monascus*

30. Select the correct match :-
(1) *Aspergillus niger* - Acetic acid
(2) Streptokinase - Immunosuppressive
(3) Cyclosporin - A - Clot buster
(4) Statins - Cholesterol lowering agent

31. Biogas is the mixture of gases produced by the microbial activity. The type of the gas produced depends upon:–
(1) type of microbes
(2) type of organic substrate / waste
(3) size of digester
(4) (1) and (2) both

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32. Which biocontrol agent in very common in root ecosystem & is effective against several plant pathogens?
(1) Baculoviruses
(2) *Trichoderma*
(3) Nucleopolyhedro virus
(4) Ladybird beetle & Dragonflies

33. Which of the following bacterium is associated with production of bioinsecticide is?
(1) *Bacillus subtilis*
(2) *Bacillus thuringensis*
(3) *Agrobacterium*
(4) *Azotobactor*

34. Bio pesticide include :-
(1) Only bioinsecticide
(2) Only bioherbicide
(3) Bioinsecticide & bioherbicide
(4) Bioherbicide, bioinsecticide & biofertilisers

35. *Bacillus thuringiensis* is used to control :-
(1) Moth (2) Flies
(3) Mosquito (4) All the above

36. *Trichoderma* has proved a useful microorganism for :-
(1) Gene transfer in higher plants
(2) Biological control of soil-borne plant pathogens
(3) Bioremediation of contaminated soils
(4) reclamation of wastelands

37. Microbial insecticide is :-
(1) *Bacillus polymixa*
(2) *Bacillus brevis*
(3) *Bacillus subtilis*
(4)*Bacillus thuringenesis*

38. Ladybird is useful to get rid of:-
(1) Aphids (2) Mosquitoes
(3) Boll worm (4) Jassids

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	3	3	2	3	3	1	1	2	4	4	4	1	1	3
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	1	1	1	2	3	1	3	4	2	3	1	2	3	4
Question	31	32	33	34	35	36	37	38							
Answer	4	2	2	3	4	2	4	1							

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2008

1. Which one of the following is being tried in India as a biofuel substitute for fossil fuels ?
(1) *Jatropha* (2) *Musa*
(3) *Aegilops* (4) *Azadirachta*

AIPMT Mains 2011

2. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct ?
(1) *Aspergillus niger* - citric acid
(2) Yeast - Statins
(3) *Acetobacter aceti* - acetic acid
(4) *Clostridium butylicum* - lactic acid

3. Read the following statement having two blanks (A and B) :
"A drug used for ___(A)___ patients is obtained from a species of the organism ___(B)___ ."
The one correct option for the two blanks is:-

	Blank - A	**Blank - B**
(1)	AIDS	*Pseudomonas*
(2)	Heart	*Penicillium*
(3)	Organ-transplant	*Trichoderma*
(4)	Swine flu	*Monascus*

AIPMT Pre 2012

4. Yeast is used in the production of :-
(1) Bread and beer
(2) Cheese and butter
(3) Citric acid and lactic acid
(4) Lipase and pectinase

5. A patient brought to a hospital with myocardial infarction is normally immediately given :-
(1) Cyclosporin-A (2) Statins
(3) Penicillin (4) Streptokinase

6. Which one of the following is an example of carrying out biological control of pests/ diseases using microbes?
(1) Bt-Cotton to increase cotton yield
(2) Lady bird beetle against aphids in mustard
(3) Trichoderma sp. against certain plant pathogens.
(4) Nucleopolyhedrovirus against white rust in Brassica

TG: @Chalnaayaaar

7. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are ones categorised as:-
(1) Chemosynthetic autotrophs
(2) Heterotrophic bacteria
(3) Cyanobacteria
(4) Archaebacteria

8. *Monascus purpureus* is a yeast used commercially in the production of :-
(1) citric acid
(2) blood chlolesterol lowering statins
(3) ethanol
(4) streptokinase for removing clots from the blood vessels.

AIPMT Mains 2012

9. In gobar gas, the maximum amount is that of:-
(1) Propane
(2) Carbon dioxide
(3) Butane
(4) Methane

10. Consider the following four statements (a-d) and select the option which includes all the correct ones only:-
(a) Single cell *Spirulina* can produce large quantities of food rich in protein, minerals, vitamins etc.
(b) Body weight-wise the microorganism *Methylophilus methylotrophus* may be able to produce several times more proteins than the cows per day.
(c) Common button mushrooms are a very rich source of vitamin C.
(d) A rice variety has been developed which is very rich in calcium.
Options :
(1) Statements (b) , (c) and (d)
(2) Statements (a) , (b)
(3) Statements (c) , (d)
(4) Statements (a) , (c) and (d)

TG: @Chalnaayaaar

NEET-UG 2013

11. A good producer of citric acid is :-
(1) *Saccharomyces* (2) *Aspergillus*
(3) *Pseudomonas* (4) *Clostridium*

12. During sewage treatment, biogases are produced which include :-
(1) hydrogen sulphide, nitrogen, methane
(2) methane, hydrogen sulphide, carbon dioxide
(3) methane, oxygen, hydrogen sulphide
(4) hydrogen sulphide, methane, sulphur dioxide

Re-AIPMT 2015

13. Match the following list of microbes and their importance :-

(a)	*Saccharomyces cerevisiae*	(i)	Production of immunosuppressive agents
(b)	*Monascus purpureus*	(ii)	Ripening of Swiss cheese
(c)	*Trichoderma polysporum*	(iii)	Commercial production of ethanol
(d)	*Propionibacterium sharmanii*	(iv)	Production of blood cholesterol lowering agents

	(a)	(b)	(c)	(d)
(1)	(iii)	(i)	(iv)	(ii)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iv)	(ii)	(i)	(iii)

NEET-I 2016

14. Which of the following is wrongly matched in the given table ?

	Microbe	Product	Application
(1)	*Trichoderma pdyspomm*	Cyclosporin A	immunosup-pressive drug
(2)	*Monascus purpureus*	Statins	lowering of blood cholesterol
(3)	*Streptococcus*	Streptokinase	removal of clot from blood vessel
(4)	*Clostridium butylicum*	Lipase	removal of oil stains

15. The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the :-
(1) Halophiles
(2) Thermoacidophiles
(3) Methanogens
(4) Eubacteria

NEET-II 2016

16. Match **Column–I** with **Column–II** and select the correct option using the codes given below:-

Column-I		Column-II	
(a)	Citric acid	(i)	*Trichoderma*
(b)	Cyclosporin A	(ii)	*Clostridium*
(c)	Statins	(iii)	*Aspergillus*
(d)	Butyric acid	(iv)	*Monascus*

Codes :

	a	b	c	d
(1)	i	iv	ii	iii
(2)	iii	iv	i	ii
(3)	iii	i	ii	iv
(4)	iii	i	iv	ii

17. The source of cyclosporin-A is :-
(1) *Acetobacter aceti*
(2) *Saccharomyces cerevisiae*
(3) *Aspergillus niger*
(4) *Trichoderma polysporum*

18. Statins commmercially used as blood cholesterol lowering agents are produced by:-
(1) *Agrobacterium tumefaciens*
(2) *Trichoderma polysporum*
(3) *Monascus purpureus*
(4) *Trichoderma viridae*

19. Which of the following is a free living biocontrol microbial agent for plant pathogen?
(1) Mucor (2) Glomus
(3) *Trichoderma* (4) *Rhizobium*

20. Biological control agent obtained from :-
(1) *Bacillus thuringiensis*
(2) *E.coli*
(3) *Agrobacterium tumifaciens*
(4) *Meloidogyne incognitia*

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NEET (UG) 2017

21. Which of the following is correctly matched for the product produced by them ?
(1) *Methanobacterium* : Lactic acid
(2) *Penicillium notatum* : Acetic acid
(3) *Sacchromyces cerevisiae* : Ethanol
(4) *Acetobacter aceti* : Antibiotics

NEET (UG) 2018

22. Conversion of milk to curd improves its nutritional value by increasing the amount of :-
(1) Vitamin D (2) Vitamin A
(3) Vitamin B_{12} (4) Vitamin E

NEET (UG) 2019

23. Match the following organisms with the products they produce :-

(a) *Lactobacillus*	(i) Cheese
(b) *Saccharomyces cerevisiae*	(ii) Curd
(c) *Aspergillus niger*	(iii) Citric Acid
(d) *Acetobacter aceti*	(iv) Bread
	(v) Acetic Acid

Select the **correct** option.

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(iv)	(v)	(iii)
(2)	(ii)	(iv)	(iii)	(v)
(3)	(iii)	(iv)	(v)	(i)
(4)	(ii)	(i)	(iii)	(v)

24. Which of the following can be used as a biocontrol agent in the treatment of plant disease?
(1) *Trichoderma* (2) *Chlorella*
(3) *Anabaena* (4) *Lactobacillus*

25. Which of the following is a commercial blood cholesterol lowering agent?
(1) Cyclosporin A (2) statin
(3) Streptokinase (4) Lipases

26. Select the **correct** group of biocontrol agents:
(1) *Bacillus thuringiensis*,Tobacco mosaic virus, Aphids
(2) *Trichoderma, Baculovirus, Bacillus thuringiensis*
(3) *Oscillatoria, Rhizobium, Trichoderma*
(4) *Nostoc, Azospirillium, Nucleopolyhedrovirus*

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NEET (UG) 2019 (Odisha)

27. A biocontrol agent to be a part of an integrated pest management should be :-
(1) Species-specific and symbiotic
(2) Free living and broad spectrum
(3) Narrow spectrum and symbiotic
(4) Species-specific and inactive on non-target organisms

28. Which of the following statements about methanogens is not correct ?
(1) They can be used to produce biogas.
(2) They are found in the rumen of cattle and their excreta
(3) They grow aerobically and breakdown cellulose-rich food.
(4) They produce methane gas.

29. Among the following pairs of microbes, which pair has both the microbes that can be used as biofertilizers?
(1) *Aspergillus* and *Rhizopus*
(2) *Rhizobium* and *Rhizopus*
(3) *Cyanobacteria* and *Rhizobium*
(4) *Aspergillus* and *Cyanobacteria*

NEET (UG) 2020

30. Match the following columns and select the correct option:-

Column-I		Column-II	
(a)	*Clostridium butylicum*	(i)	Cyclosporin-A
(b)	*Trichoderma polysporum*	(ii)	Butyric Acid
(c)	*Monascus purpureus*	(iii)	Citric Acid
(d)	*Aspergillus niger*	(iv)	Blood cholesterol lowering agent

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iv)	(iii)	(ii)	(i)
(2)	(iii)	(iv)	(ii)	(i)
(3)	(ii)	(i)	(iv)	(iii)
(4)	(i)	(ii)	(iv)	(iii)

TG: @Chalnaayaaar

NEET (UG) 2020 (COVID-19)

31. For the commercial and industrial production of Citric Acid, which of the following microbes is used ?
(1) *Aspergillus niger*
(2) *Lactobacillus sp*
(3) *Saccharomyces cerevisiae*
(4) *Clostridium butylicum*

32. Match the following columns and select the correct option :-

Column-I	Column-II
(a) Dragonflies	(i) Biocontrol agents of several plant pathogens
(b) *Bacillus thuringiensis*	(ii) Get rid of Aphids and mosquitoes
(c) Glomus	(iii) Narrow spectrum insecticidal applications
(d) Baculoviruses	(iv) Biocontrol agents of lepidopteran plant pests
	(v) Absorb phosphorus from soil

(1) (a)-(iii), (b)-(v), (c)-(iv), (d)-(i)
(2) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
(3) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(v)
(4) (a)-(ii), (b)-(iv), (c)-(v), (d)-(iii)

33. Cyclosporin A, used as immuno suppression agent, is produced from :-
(1) *Monascus purpureus*
(2) *Saccharomyces cerevisiae*
(3) *Penicillium notatum*
(4) *Trichoderma polysporum*

NEET(UG) 2021

34. Match **List - I** with **List - II:-**

List-I		List-II	
(a)	*Aspergillus niger*	(i)	Acetic Acid
(b)	*Acetobacter aceti*	(ii)	Lactic Acid
(c)	*Clostridium butylicum*	(iii)	Citric Acid
(d)	*Lactobacillus*	(iv)	Butyric Acid

Choose the **correct** answer from the options given below.

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(i)	(iv)	(ii)
(2)	(i)	(ii)	(iii)	(iv)
(3)	(ii)	(iii)	(i)	(iv)
(4)	(iv)	(ii)	(i)	(iii)

NEET(UG) 2022

35. Identify the microorganism which is responsible for the production of an immune suppressive molecule cyclosporin A?
(1) *Clostridium butylicum*
(2) *Aspergillus niger*
(3) *Streptococcus cerevisiae*
(4) *Trichoderma polysporum*

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	4	3	1	4	3	2	2	4	2	2	2	2	4	3
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	4	4	3	3	1	3	3	2	1	2	2	4	3	3	3
Question	31	32	33	34	35										
Answer	1	4	4	1	4										

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Exercise - III Master Your Understanding

EXERCISE-III(A) NCERT BASED QUESTIONS

1. Nutritionally curd is more suitable then milk. Which of the following reason not supporting to this view:-
(1) It increasing vitamin B_{12}
(2) It checks disease causing microbes
(3) LAB convert lactose into lactic curd
(4) It provide additional proteins

2. Large holes in "Swiss cheese" are due to production of large amount of CO_2 by ..... bacterium:-
(1) *Leuconostoc mesenteroides*
(2) *Propionibacterium sharmanii*
(3) *Thermococcus proteus*
(4) *Staphylococcus thermophiles*

3. Which of the following is not a product of distillation:-
(1) Whisky (2) Brandy
(3) Wine (4) Rum

4. Find out odd one with reference to distillation:-
(1) Beer (2) Wine
(3) Both (1) and (2) (4) Vodka

5. Which of the following bacteria was associated with discovery of penicillin
(1) *Streptococus*
(2) *Staphylococcus*
(3) *Saccharomyces cerveisiae*
(4) *Propionobacterium*

6. Full potential of penicillin as an effective antibiotic was established by:-
(1) Alexander Flemming
(2) Ernest chain
(3) Howard florey
(4) Both 2 and 3

7. Which of the following is "Clot buster":-
(1) Citric acid
(2) Streptokinase
(3) Cyclosporin
(4) Statins

TG: @Chalnaayaaar

8. Which of the following chemicals, used as an immunosuppressive agent in organ trans-plantation:-
(1) Streptokinase
(2) Cyclosporin - A
(3) Statins
(4) Citric acid

9. Match the following :-

A. Pectinases	i. Blood cholesterol Lowering agents
B. Streptokinases	ii. Immunosuppressive agents
C. Cyclosporin-A	iii. Clot-busters
D. Statin	iv. Clearifying agents

	A	B	C	D
(1)	iv	iii	ii	i
(2)	iv	iii	i	ii
(3)	iii	iv	ii	i
(4)	i	ii	iii	iv

10. Match the following:-

A. Citric acid	i. *Haemolytic streptococcus*
B. Streptokinase	ii. *Aspergillus niger*
C. Cyclosporin-A	iii. *Monascus purpureus*
D. Statins	iv. *Trichoderma polysporum*

	A	B	C	D
(1)	i	ii	iii	iv
(2)	ii	i	iii	iv
(3)	ii	i	iv	iii
(4)	iv	ii	iii	i

EXERCISE-III(B) (ANALYTICAL QUESTIONS)

11. Functioning of statin is based on:-
(1) Competitive inhibition
(2) Endproduct inhibition
(3) Allosteric inhibition
(4) Negative feed back inhibition

TG: @Chalnaayaaar

12. The technology of biogas production was developed in India mainly due to efforts of :-
(1) IARI (2) KVIC
(3) IPM (4) Both (1) and (2)

13. *Bacillus thuringiensis* show their inhibitory effect on which part of the insect body:-
(1) Gut (2) Respiratory tract
(3) Nervous system (4) Circulatory system

14. Which of the following biological agents are used for species specific, narrow spectrum insecticidal applications:-
(1) Adenoviruses
(2) Nucleopolyhedrosis viruses
(3) Retroviruses
(4) Trichoderma

15. Which of the following is one of the advantage of application of viruses as bioinsecticides?
(1) They are less effective
(2) They are host specific
(3) They are costly
(4) They can not obtain easily

16. In which of the following conditions use of baculoviruses is desirable?
(1) When they are used as part of IPM
(2) When an ecologically sensitive area is being treated
(3) When beneficial insects are being conserved
(4) All of the above

17. Use of biofertilizer is the part of:-
(1) Inorganic farming
(2) Organic farming
(3) Energy cropping
(4) Energy plantation

18. Members of which of the following fungal genus mainly participate in the mycorrhiza formation?
(1) *Azotobacter*
(2) *Fusarium*
(3) *Rhizopus*
(4) *Glomus*

19. Which of the following is not an advantage of mycorrhiza?
(1) Phosphorus absorption
(2) Resistance to root borne pathogens
(3) Nitrogen fixation
(4) Tolerance to salinity and draught

20. Cultivation of which of the following crop plant specially get benefitted by application of cyanobacteria?
(1) Maize
(2) legumes
(3) Wheat
(4) Rice

EXERCISE - III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	2	3	4	2	4	2	2	1	3	1	4	1	2	2
Question	16	17	18	19	20										
Answer	4	2	4	3	4										

TG: @Chalnaayaaar

Important Notes